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CLAIMS

1. A pre-treatment apparatus for an analytical metal sample, the apparatus comprising:

(1) a treatment chamber having a sample charging port which can be opened and closed and provided at the top of the chamber, a sample discharging port which can be opened and closed and provided at the bottom of the chamber, and a gas inlet and gas outlet;

(2) a sample carrying bar joined to a sample holder also used as a sputtering electrode, and provided to pass through at least one side wall of the treatment chamber so as to be substantially horizontally movable and axially rotatable; and

(3) a sputtering counter electrode at least having portions arranged opposite to each other in a region not inhibiting the charge and discharge of an analytical metal sample so that the sample holder can be arranged in the counter electrode.

2. A pre-treatment apparatus according to Claim 1, wherein the sample contact area of the sample holder is 10% or less of the surface area of the analytical metal sample.

3. A pre-treatment apparatus according to Claim 1, wherein the counter electrode at least having portions arranged opposite to each other has a cylindrical shape.

4. An elementary analysis apparatus for a metal, comprising

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a sample inlet port connected to a portion below the sample discharging port of the pre-treatment apparatus according to any one of Claims 1 to 3.

5. A pre-treatment method for elementary analysis of a metal using the pre-treatment apparatus according to any one of Claim 1 to 3, the method comprising the steps of:

(1) charging an analytical metal sample in the sample holder through the sample charging port;

(2) evacuating the treatment chamber to form a reduced pressure atmosphere, and then controlling the inside of the treatment chamber to a predetermined pressure of 100 Pa to 1000 Pa by using an inert gas;

(3) moving the analytical metal sample on the sample holder by the sample carrying bar to a position in the sputtering counter electrode at least having portions opposite to each other;

(4) applying a voltage between the sample-side electrode and the sputtering counter electrode to clean the surface of the analytical metal sample by sputtering;

(5) moving the sample holder to a position above the sample discharging port by the sample carrying bar;

(6) rotating the sample carrying bar to move the analytical metal sample to an elementary analysis apparatus through the open sample discharging port.